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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/706,799

11/12/2003

Joel S. Karp

UPN-4296

7178

23377

7590

10/19/2005

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EXAMINER

SUNG, CHRISTINE

ART UNIT

PAPER NUMBER

2884

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/706,799

Applicant(s)

KARP ET AL.

Examiner

Christine Sung

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
- Paper No(s)/Mail Date 0504,0704.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Claims are rejected under 35 U.S.C. 103(a) as being unpatentable over Moses (US Patent 5,015,860 A) in view of Andreaco et al. (US Patent 6,362,479 B1).

Regarding claim 1, Moses discloses a PET detector (figure 2) comprising :

A Lanthanum Halide scintillator (column 8, lines 24-27) comprising a plurality of Lanthanum Halide Crystals (Figure 1, element 11, and Figure 2, elements 22a, 22b and 22c);

A plurality of PMTs (figure 1, element 12),

Wherein the Lanthanum Halide Scintillator (elements 22 a, 22b, 22c) and the PMTs (elements 22a, 22b, 22c) are arranged respectively around a cavity for accepting a patient (figure 2, element 20).

Moses does not specify a light guide and further does not specify that it is arranged around the cavity for accepting a patient. However, Andreaco et al. discloses a PET detection apparatus (figure 3a) with a scintillation element (element 40), a light guide (element 50), and PMT (element 25). One of ordinary skill in the art would be motivated to use the light guide as disclosed by Andreaco et al. with the invention as disclosed by Moses in order to increase the accuracy of the detected radiation, as incident radiation detected by the scintillation elements are properly channeled through the light guide to the PMTs the detection elements. Without such light guide elements, stray radiation can be detected by adjacent PMTs, thus reducing the accuracy of the radiation detected.

Regarding claim 2, Moses discloses a PET scanner (figure 2) comprising:

A cavity for accepting a patient (figure 2, element 20): and

A plurality of PET detector modules (elements 22 a, 22b and 22c) arranged in a approximately cylindrical configuration about said cavity (see figure 2 arrangement of element 22 a, 22b and 22c), each PET detector including a Lanthanum Halide scintillator (Column 8, lines 24-27) comprising a plurality of Lanthanum Halide Crystals (Figure 1, element 11, and Figure 2, elements 22a, 22b and 22c), and a plurality of PMTs (figure 1, element 12), wherein said Lanthanum halide scintillator, said light guide and said PMTs are arranged respectively peripherally around said cavity (figure 2).

Moses does not specify a light guide and further does not specify that it is arranged around the cavity for accepting a patient. However, Andreaco et al. discloses a PET detection apparatus (figure 3a) with a scintillation element (element 40), a light guide (element 50), and PMT (element 25). One of ordinary skill in the art would be motivated to use the light guide as

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disclosed by Andreaco et al. with the invention as disclosed by Moses in order to increase the accuracy of the detected radiation, as incident radiation detected by the scintillation elements are properly channeled through the light guide to the PMTs the detection elements. Without such light guide elements, stray radiation can be detected by adjacent PMTs, thus reducing the accuracy of the radiation detected.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Casey (US Patent 4,743,764 A) in view of Moses (US Patent 5,015,860 A) further in view of Mullani (US Patent 4,559,597 A).

Regarding claim 3, Casey discloses a PET scanning system (Figure 2) comprising:

A PET scanner (Figure 2) comprising a cavity (element 40) for accepting a patient (element 16) and a plurality of PET detector modules (element 20) arranged in an approximately cylindrical configuration about said cavity (see figure 2), each PET detector including a scintillator (Figure 4B, element 64) comprising a plurality crystals (Figure 5b, elements 1', 2', 3', 4', 5', 6', 7', 8'), a light guide (figure 5B, element 68) and a plurality of PMTs (figure 5B, elements 70a and 70b), wherein said scintillator (Figure 4B, element 64), light guide (figure 5B, element 68) and said PMTs (elements 70a and 70b) are arranged respectively peripherally around said cavity (Figure 2). Casey does not specify the circuitry and processor and further does not specify the use of Lanthanum halide.

Moses discloses a PET scanning system that uses a Lanthanum Halide (see claim 1). One of ordinary skill in the art would be motivated to use the crystal disclosed by Moses with the invention as disclosed by Casey as such crystal have increased light output, and faster decay time constants, which increase the accuracy and speed in PET detection.

Mullani discloses a PET imager with a time stamp circuit that records the time of receipt of gamma rays by respective PET detectors and provides timing data outputs (Figure 5, element 12); and

A processor (element 14) that receives said timing data outputs (see figure 5), calculates time-of-flight of gamma rays (column 13, lines 29-43) through a patient in the cavity and uses said TOF of gamma rays in the reconstruction of images of the patient (claims 1 and 3). One of ordinary skill in the art would be motivated to use the circuitry and processing as disclosed by Mullani with the scanning device as disclosed by Casey in view of Moses order to increase the accuracy of the detection of PET events for imaging.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
6. US Pre Grant Publication 2005/0104001 A1- this reference discloses a PET scintillation device that determines time of flight, and contains all of the limitations of claims but cannot be applied as prior art.
7. US Pre Grant Publication 2005/0082484 A1- this reference discloses a scintillation device using a lanthanum halide scintillator crystal for PET detection.
8. WO 2004/044613 A2- this reference has common applicants and contains the claimed elements.
9. US Patent 5,453,623 A- this reference discloses a PET detector.

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10. US Patent 6,373,059 B1- this reference discloses a PET scanner that reconstructs images from coincidence events.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 571-272-2448. The examiner can normally be reached on Monday- Friday 7-3 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CS

Christine Sung  
Examiner  
Art Unit 2884

**OTILIA GABOR**  
**PRIMARY EXAMINER**

